

AMENDMENTS TO THE CLAIMS

The claims and their status are reflected below.

1. (Currently amended) A method for determining a status associated with a memory system, the memory system including a plurality of spare units of erase, the method comprising:

receiving user data for storage in the memory system;

calculating error correction code data from the user data;

storing the user data and the error correction code data together in a first unit of erase if the first unit of erase is not unreliable;

reassigning a first spare unit of erase of the plurality of spare units of erase and storing the user data and error correction code data together in the reassigned first spare unit of erase if the first unit of erase is unreliable;

~~updating a counter, the counter being arranged to be updated each time a spare unit of erase of the plurality of spare units of erase is reassigned, wherein the counter indicates a number of spare units of erase remaining in the plurality of spare units of erase;~~

comparing the counter to a threshold value, the threshold value being indicative of a number of spare units of erase of the plurality of spare units of erase which are yet to be reassigned in order for the memory system to be considered as reliable; and

generating an indication when comparing the counter to the threshold value yields a first result, wherein the indication is arranged to indicate that the memory system is substantially near a failure condition.

2. (Original) The method of claim 1, wherein updating the counter includes decrementing the counter each time a spare unit of erase of the plurality of spare units of erase is reassigned.

3. (Original) The method of claim 1 wherein comparing the counter to the threshold value includes determining when a value of the counter is less than or equal to the threshold value.

4. (Original) The method of claim 3 wherein the first result is arranged to indicate that the value of the counter is less than or equal to the threshold value.

5. (Original) The method of claim 1 further including:
attempting to write data to a first unit of erase;
determining when the first unit of erase is worn;
reassigning a first spare unit of erase included in the plurality of spare units of erase as the first unit of erase when it is determined that the first unit of erase is worn, wherein updating the counter includes updating the counter to indicate that the first spare unit of erase is reassigned; and
writing the data to the reassigned first spare unit of erase.

6. (Currently amended) A memory system for storing information, the memory system comprising:

a first plurality of spare units of erase on a first chip;
a second plurality of spare units of erase on a second chip;
a first storage element on the first chip, the first storage element containing a first counter and a first threshold, the first counter indicating a number of spare units of erase on the first chip which have not yet been reassigned ~~included in the plurality of spare units of erase~~, the ~~threshold~~ indicating a ~~predetermined number of spare units of erase~~;

a second storage element on the second chip, the second storage element containing a second counter and a second threshold, the second counter indicating a number of spare units of erase on the second chip which have not yet been reassigned;

a controller, the controller updating the first counter each time a spare unit of erase of the first plurality of spare units of erase is reassigned, ~~wherein the counter indicates a number of spare units of erase included in the plurality of spare units of erase which have not yet been reassigned~~, the controller comparing the first counter to the first threshold value ~~to determine if the memory system is in a condition, the condition being an end of life condition~~, the controller updating the second counter each time a spare unit of erase of the second plurality of spare units of erase is reassigned, the controller comparing the second counter to the second threshold value,

the controller generating an end-of-life indicator when either the first counter reaches the first threshold or the second counter reaches the second threshold; and

wherein the memory system ~~is arranged to operate~~ operates in conjunction with a host system and the controller ~~is arranged to reassign~~ reassigns a spare unit of erase ~~included in the plurality of spare units of erase~~ in response to a request from the host system.

7. (Currently amended) The memory system of claim 6 wherein when the controller compares the first counter to the first threshold value to determine if the memory system is in ~~the~~ an end-of-life condition, ~~and~~ the controller determines that the memory system is in the end-of-life condition when a value of the first counter is less than or equal to the first threshold value.

8. (Canceled)

9. (Currently amended) The memory system of claim 6 wherein the controller attempts to write data to a first unit of erase on the first chip ~~included in the plurality of units of erase~~, and determines if the first unit of erase is worn.

10. (Currently amended) The memory system of claim 9 wherein when it is determined that the first unit of erase is worn, the controller reassigns a first spare unit of erase included in the first plurality of spare units of erase as the first unit of erase.

11. (Currently amended) The memory system of claim 10 wherein the controller is ~~still further arranged to write~~ writes the data into the reassigned first spare unit of erase.

12. (Currently amended) The memory system of claim 6 wherein the controller attempts to write data to a first unit of erase ~~included in the plurality of units of erase, and~~ on the first chip to determine if the first unit of erase is defective.

13. (Currently Amended) The memory system of claim 12 wherein when it is determined that the first unit of erase is defective, the controller reassigns a first spare unit of erase included in the first plurality of spare units of erase as the first unit of erase.

14. (Previously presented) The memory system of claim 13 wherein the controller writes the data into the reassigned first spare unit of erase.

15. (Currently amended) The memory system of claim 6 wherein an individual one of the first plurality of spare units of erase is a sector ~~are a plurality of sectors~~, and an individual one of the second plurality of spare units of erase is a spare sector ~~are a plurality of spare sectors~~.

16. (Currently amended) The memory system of claim 6 further including:
a non-volatile memory, wherein the first plurality of spare units of erase, the second plurality of spare units of erase, and the first storage element are included in the non-volatile memory.

17. (Previously presented) The memory system of claim 6 wherein the memory system is a non-volatile memory system.

18-19. (Canceled)

20. (Original) The memory system of claim 6 wherein the memory system is one of a PC card, a CompactFlash card, a MultiMedia Card, a SmartMedia card, a Memory Stick card, and a Secure Digital card.

21. (Currently amended) A system, comprising:
a host system;
a memory system on a first chip, the memory system interfacing ~~being arranged to interface~~ with the host system, the memory system including,
a plurality of units of erase,
a plurality of spare units of erase, and

a first storage element, the first storage element ~~containing being arranged to contain~~ a counter and a threshold, the counter ~~indicating being arranged to indicate~~ a number of spare units of erase included in the plurality of spare units of erase, the threshold ~~indicating being arranged to indicate~~ a number of spare units of erase which are not to be reassigned; and

a controller ~~on the first chip~~, the controller ~~updating being arranged to update~~ the counter each time a spare unit of erase of the plurality of spare units of erase is reassigned, wherein the counter indicates a number of spare units of erase included in the plurality of spare units of erase which have yet to be reassigned, the controller ~~comparing further being arranged to compare~~ the counter to the threshold value to determine if the memory system is substantially near ~~a-an end-of-life condition, the condition being arranged to characterize the memory system as being~~ substantially unreliable.

22. (Currently amended) The system of claim 21 wherein ~~when the controller is included in the memory system and is arranged to compare the counter to the threshold value to determine if the memory system is substantially near the condition~~, the controller determines when a value of the counter is less than or equal to the threshold value.

23. (Original) The system of claim 22 wherein when it is determined that the value of the counter is less than or equal to the threshold value, the controller generates an indication that the memory system is substantially near the condition.

24. (Original) The system of claim 21 wherein the host system is arranged to request that data be written to the memory system, and the controller is included in the memory system, the controller further being arranged to attempt to write the data to a first unit of erase included in the plurality of units of erase in response to the request, and to determine if the first unit of erase is worn.

25. (Original) The system of claim 24 wherein when it is determined that the first unit of erase is worn, the controller reassigns a first spare unit of erase included in the plurality of

spare units of erase as the first unit of erase and writes the data into the reassigned first spare unit of erase.

26. (Original) The system of claim 21 wherein the host system is arranged to request that data be written to the memory system, and the controller is included in the memory system, the controller further being arranged to attempt to write the data to a first unit of erase included in the plurality of units of erase in response to the request, and to determine if the first unit of erase is defective.

27. (Original) The system of claim 26 wherein when it is determined that the first unit of erase is defective, the controller reassigns a first spare unit of erase included in the plurality of spare units of erase as the first unit of erase and writes the data into the reassigned first spare unit of erase.

28. (Currently amended) The system of claim 21 wherein an individual one of the plurality of units of erase is a sector~~are a plurality of sectors~~, and an individual one of the plurality of spare units of erase is a spare sector~~are a plurality of spare sectors~~.

29. (Original) The system of claim 21 wherein the memory system is a memory card.

30. (Original) The system of claim 29 wherein the memory card is one selected from the group consisting of a PC card, a CompactFlash card, a MultiMedia card, a Smart Media card, a Memory Stick card, and a Secure Digital card.

31. (Original) The system of claim 21 wherein the host system is arranged to capture information and to attempt to store the information in the memory system.

32. (Currently amended) The system of claim 31 wherein the information is one of ~~still image information~~, audio information, ~~video image information~~, and wireless information.

33. (Currently amended) The system of claim 32 wherein the host system is one of a ~~digital camera, a video camera,~~ a cellular communications device, an audio player, and a video player.

34. (Currently amended) A memory system for storing information, the memory system comprising:

- a plurality of spare units of erase;
- means for storing a counter;
- means for storing a threshold;
- means for reassigning a spare unit of erase of the plurality of spare units of erase;
- means for decrementing ~~updating~~ the counter, the counter being decremented ~~arranged to be updated~~ each time a spare unit of erase of the plurality of spare units of erase is reassigned, wherein the counter indicates a number of spare units of erase remaining in the plurality of spare units of erase;
- means for comparing the counter to the threshold value, the threshold value being indicative of a number of spare units of erase of the plurality of spare units of erase which are yet to be reassigned in order for the memory system to be considered as useable; and
- means for generating an indication when comparing the counter to the threshold value yields a first result, wherein the indication is arranged to indicate that the memory system is substantially near a failure condition.

35. (Canceled)

36. (Original) The memory system of claim 34 wherein the means for comparing the counter to the threshold value include means for determining when a value of the counter is less than or equal to the threshold value.

37. (Original) The memory system of claim 36 wherein the first result is arranged to indicate that the value of the counter is less than or equal to the threshold value.

38. (Previously presented) The memory system of claim 34 further including:
means for attempting to write data to a first unit of erase;
means for determining when the first unit of erase is worn, wherein the means for reassigning the unit of erase include means for reassigning a first spare unit of erase included in the plurality of spare units of erase as the first unit of erase when it is determined that the first unit of erase is worn, and wherein the means for updating the counter include means for updating the counter to indicate that the first spare unit of erase is reassigned; and
means for writing the data to the reassigned first spare unit of erase.

39 - 40. (Canceled)

41. (Previously presented) A method for determining a status associated with a non-volatile memory system, the non-volatile memory system including a plurality of spare units of erase, the method comprising:

automatically determining when the non-volatile memory system is nearing a condition which renders the non-volatile memory system as being substantially unreliable;

generating an indication when it is determined that the non-volatile system is nearing the condition which renders the non-volatile memory system as being substantially unreliable, wherein the indication is arranged to indicate that the non-volatile system is nearing the condition which renders the non-volatile memory system as being substantially unreliable;

saving the indication;

wherein automatically determining when the non-volatile memory system is nearing a condition which renders the non-volatile memory system as being substantially unreliable includes:

updating a counter, the counter being arranged to be updated each time a spare unit of erase of the plurality of spare units of erase is reassigned, wherein the counter indicates a number of spare units of erase remaining in the plurality of spare units of erase; and

comparing the counter to a threshold value, the threshold value being indicative of a number of spare units of erase of the plurality of spare units of erase which are not to be reassigned in order for the memory system to be considered as useable.

42. (Original) The method of claim 41 wherein generating the indication when it is determined the non-volatile system is nearing the condition which renders the non-volatile memory system as being substantially unreliable includes:

determining when comparing the counter to the threshold value yields a first result, wherein the indication is arranged to indicate that the memory system is nearing the condition which renders the non-volatile memory systems as being substantially unreliable when comparing the counter to the threshold value yields the first result.

43. (Previously presented) The method of claim 41 wherein the condition which renders the non-volatile memory systems as being substantially unreliable when comparing the counter to the threshold value yields the first result is one of an end-of-life condition and a fault condition.

44. (Canceled)

45. (Previously presented) A non-volatile memory system for storing information, the non-volatile memory system comprising:

a plurality of spare units of erase;

means for automatically determining when the non-volatile memory system is nearing a condition which renders the non-volatile memory system as being substantially unreliable; and

means for generating an indication when it is determined that the non-volatile system is nearing the condition which renders the non-volatile memory system as being substantially unreliable, wherein the indication is arranged to indicate that the non-volatile system is nearing the condition which renders the non-volatile memory system as being substantially unreliable;

wherein the non-volatile memory system is one of a PC card, a CompactFlash card, a MultiMedia card, a Memory Stick card, a Smart Media card, and a Secure Digital card;

wherein the means for automatically determining when the non-volatile memory system is nearing a condition which renders the non-volatile memory system as being substantially unreliable include:

means for updating a counter, the counter being arranged to be updated each time a spare unit of erase of the plurality of spare units of erase is reassigned, wherein the counter indicates a number of spare units of erase remaining in the plurality of spare units of erase; and

means for comparing the counter to a threshold value, the threshold value being indicative of a number of spare units of erase of the plurality of spare units of erase which are not to be reassigned in order for the memory system to be considered as useable.

46. (Original) The non-volatile memory system of claim 45 wherein the means for generating the indication when it is determined the non-volatile system is nearing the condition which renders the non-volatile memory system as being substantially unreliable include:

means for determining when the means for comparing the counter to the threshold value yields a first result, wherein the indication is arranged to indicate that the memory system is nearing the condition which renders the non-volatile memory systems as being substantially unreliable when the means for comparing the counter to the threshold value yields the first result.

47. (Canceled)